When first proposed on the basis of a few collections this taxon seemed easily distinguishable from *Tillandsia tricolor*. However, recent collections from Guatemala break down all distinctions except the highly artificial one of size. It seems best, therefore, to regard *T. melanopus* as a Central American variety of the Mexican *T. tricolor*.

Vriesia montana (L. B. Smith) L. B. Smith & Pittendrigh, comb. nov.
Thecophyllum montanum L. B. Smith in Yuncker, Field Mus. Publ. Bot. **17**: 319. 1938.

The validity of the genus *Thecophyllum* will be discussed in detail in a later paper by Dr. C. S. Pittendrigh and myself, but the above combination must be made now.

ENTOMOLOGY.—*Studies in Panama* Culicoides (*Diptera: Heleidae*): I, *Descriptions of six new species.*[1] Willis W. Wirth[2] and Franklin S. Blanton.[3] (Communicated by Curtis W. Sabrosky.)

This paper is the first of a short series to bring up to date our taxonomic knowledge of the Panama species of biting midges of the genus *Culicoides* Latreille. In 1951 the junior author began a comprehensive survey of the biting Diptera of Panama. It soon became apparent that the large numbers of both male and female *Culicoides* which were collected in the traps in use for this survey would afford an unexcelled opportunity for a taxonomic study. The senior author, with a great taxonomic interest in the Heleidae, and advantageously located at the U. S. National Museum, where the types of a number of Neotropical species of *Culicoides* are located, was therefore invited to join in a cooperative study.

Our efforts were greatly stimulated by the recent appearance of several important papers on the Caribbean biting midges of this genus, including papers by Barbosa (1947), Fox (1946, 1947), Macfie (1948), and Ortiz (1950, 1951). All these authors have presented keys for the identification of the Caribbean species. With the great amount of descriptive work concurrently going on, however, keys are out of date almost as soon as published. Nevertheless, they are invaluable as working tools, and in a later paper of this series we will present a key to the Panama species.

Our terminology is the same as that employed by Wirth (1952), where a more complete description of terms can be found. The most important difference between our usage and that of some other *Culicoides* workers is in our designation of the wing veins and corresponding cells according to Tillyard's modification of the Comstock-Needham system; thus veins Cu_1 and Cu_2 of older workers become M_{3+4} and Cu_1, respectively, and cell Cu_1 becomes cell M_4 (labeled in Fig. 2). Length is measured in relaxed specimens from the anterior edge of the mesonotum to the tip of the abdomen; a more reliable measurement is the wing length, which along with the costal ratio is measured from the basal arculus. Body measurements, antennal and palpal proportions, and descriptions of male genitalia are obtained from specimens cleared in pure phenol and mounted on slides in phenol-balsam mixture after gradual infiltration. By this method dried specimens can be relaxed and cleared, and the refractive index of the phenol-balsam brings out the minute details of the antennal and palpal sensoria, the female spermathecae, and the internal structures of the male genitalia. In the following descriptions no special mention is made of the rudimentary third spermatheca and sclerotized ring of the female internal reproductive organs, as they are present in all Neotropical species that we have studied.

To our knowledge Ortiz (1951) was the first to show the presence of the dense tufts of short, curved setae around the margins of disciform, hyaline sensoria at the apices of certain antennal segments. We have made a comparative study of them in our species with very promising results. These tufts are always present on the third (first flagellar)

[1] Published under the auspices of the Surgeon General, U. S. Army, who does not necessarily assume responsibility for the professional opinions expressed by the authors.

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segment, occasionally on segments 4– or 6–7, nearly always on 8, 9, and 10, but only rarely on the five distal segments except in the species with the second anterior radial cell in a light area, where they appear on some or all of these segments.

The types of our new species are deposited in the collection of the U. S. National Museum in Washington. Unless otherwise indicated, all specimens were collected by the junior author in light traps. We wish especially to acknowledge the generous assistance of Irving Fox, John Lane, and Ignacio Ortiz-Cordero in making comparisons of species or furnishing valuable opinions on certain species, and for supplying specimens for comparative study. P. A. Woke and L. E. Rozeboom furnished Panama material for study, including some specimens from series which in part formed the type series of new species described by Fox (1947) and Barbosa (1947). We also gratefully acknowledge the assistance rendered by Col. Francis P. Kintz, Surgeon, and Lt. Col. Edward J. Dehne, Chief of Preventive Medicine, United States Army Caribbean, as well as personnel of the 25th Preventive Medicine Survey Detachment.

Culicoides uniradialis Wirth and Blanton, n. sp.
Fig. 1, *a–d*

♀. Length 1.1 mm, wing 1.1 mm by 0.4 mm.

Head pruinose dark grayish brown; eyes broadly separated, bare. Antennae with flagellar segments in proportion of 25:22:22:22:20:20:20:20:20:20:20:20:30, all except apices of segments 3–10 pale, remainder dark; distal sensory tufts on segments 3, 8, 9, 10. Palpal segments (Fig. 1, *b*) in proportion of 10:20:27:10:10, third segment very slightly swollen, with a small shallow sensory pit.

Mesonotum rather narrow, color uniform light tawny brown, with numerous short, appressed, yellowish hairs; scutellum concolorous with mesonotum. Postscutellum dark pruinose brown, pleura pale with transverse median area darker. Legs brown, subapical rings on femora, bases and apices of mid and hind tibiae, and distal tarsal segments on all legs, pale.

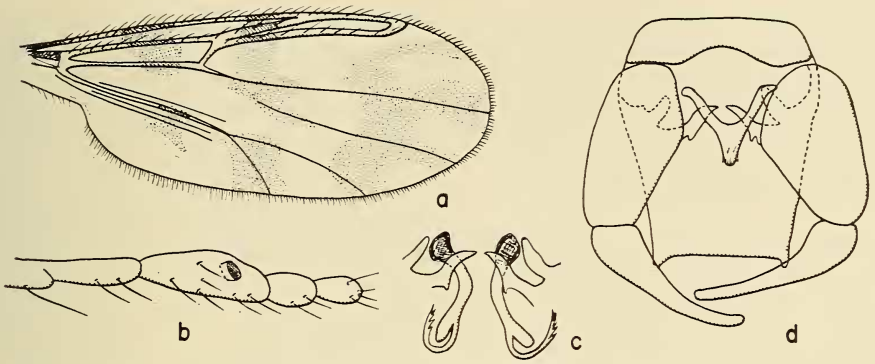
Wing (Fig. 1, *a*) with anterior radial cells not separated, the single cell long and narrow; costa to 0.75–0.8 of wing length; macrotrichia entirely absent. Wing predominantly pale yellowish, with faint, grayish, irregular bands: anterior radial cell pale except where covered by second dark wing band from a fourth of the way to halfway to apex. First dark wing band at proximal fourth of wing from costa to anterior media, interrupted and appearing again on base of vein M_{3+4} + Cu. Second band across second fourth of anterior radial cell taking in base of medial fork, interrupted and appearing again across basal half of mediocubital fork. Third band beginning as an oblique, dark mark across middle of cell R_5 from wing margin near apex of cell, broadening toward vein M_1 and extending along this vein and forming a broad dark mark in front of its apex; continuing broadly across middle of cells M_1 and M_2 to apex of vein M_{3+4} and following vein M_2 also to apex. Halteres pale.

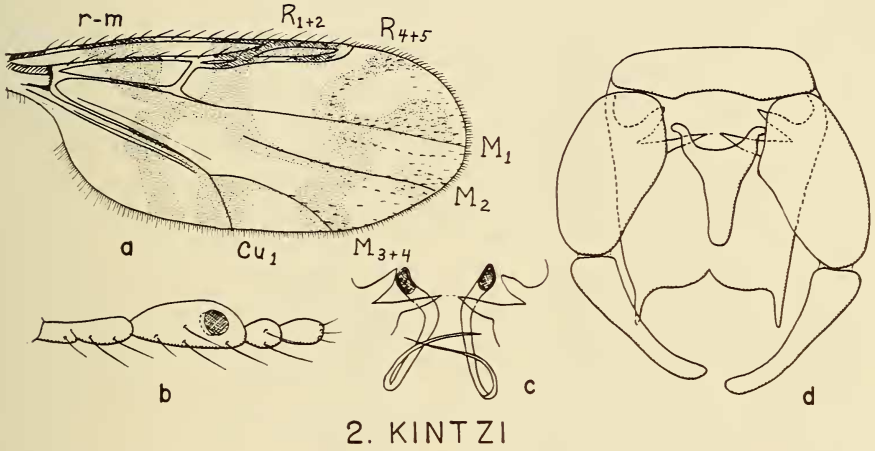
Abdomen brown; spermathecae two, small, subequal and pyriform in shape.

Male genitalia (Fig. 1, *c*, *d*). Ninth sternite very short with very shallow mesal excavation, the membrane bare; ninth tergite short, quadrate, with very small, widely separated, apicolateral processes. Basistyles stout, ventral roots stout and boat-hook shaped, dorsal roots not so long and rather stout; dististyles nearly straight, gradually tapered to tips which are blunt and not bent. Aedeagus short and stout, basal arms stout and forming anterior arch to half of total length; apex stout and rounded with faint serrations and apparently a few appressed, sharp, flattened, subapical spines. Parameres (Fig. 1, *c*) with bases knobbed; stems curved gently, each with ventral pouch about one-and-one-half times as long as its diameter, distal portions narrowed, tapered to sharp apical points with three or four subapical lateral barbs.

Holotype ♀, allotype, Mojinga Swamp, Fort Sherman, Canal Zone, October 24, 1951, F. S Blanton (light trap) (type no. 61497, U.S.N.M.). Paratypes: 12 ♂♂, 54 ♀♀, same data as type; 2 ♂♂, 2 ♀♀, Loma Boracha, C. Z., October 29, 1951.

Apparently related to the next species, *kintzi* n.sp., which it superficially resembles in its uniformly tawny yellow color, wings with costa elongated, the apex in a light area, and the dark markings of the wing reduced, diffuse, and in cell R_5, oblique. However, according to the male genitalia these species probably belong to different groups, since in *uniradialis* the ventral roots are boat-hook shaped and the parameres have a ventral pouch and distal barbs, all these being lacking in *kintzi*. The other known species, with few exceptions, which have the second





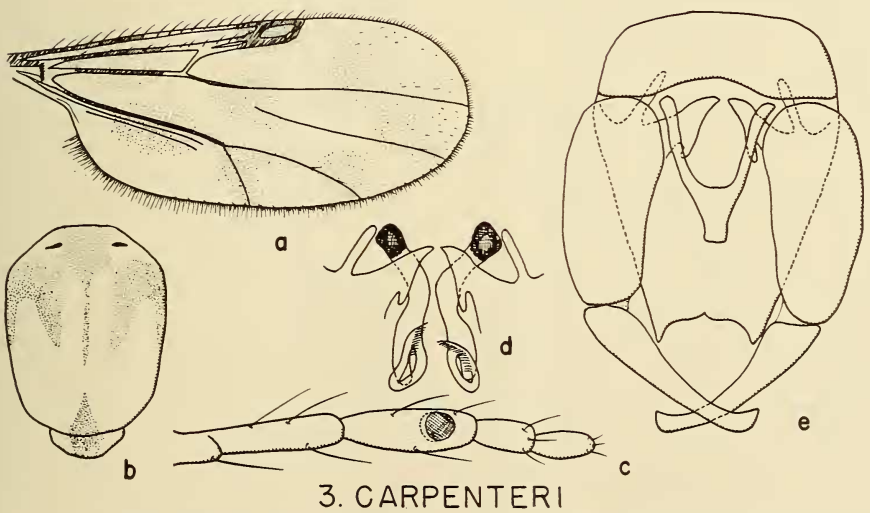


Fig. 1.—*Culicoides uniradialis: a*, Female wing; *b*, female palpus; *c*, male parameres; *d*, male genitalia, parameres removed. Fig. 2.—*Culicoides kintzi: a*, Female wing, with important veins labeled; *b*, female palpus; *c*, male parameres; *d*, male genitalia. Fig. 3.—*Culicoides carpenteri: a*, Female wing· *b*, mesonotal pattern; *c*, female palpus; *d*, male parameres; *e*, male genitalia.

anterior radial cell in a light spot belong to the well defined *pulicaris* or *guttatus* groups with characteristic and greatly different male genitalia, usually contiguous eyes and distal, sensory tufts on some or all of the last five antennal segments.

Culicoides kintzi Wirth and Blanton, n. sp.
Fig. 2, *a–d*

♀. Length 1.0 mm, wing 0.9 mm by 0.4 mm.

Head dark brown; eyes broadly separated, bare. Antennae with flagellar segments in proportion of 20:15:15:15:15:15:15:15:15:15:18:18:26, distal sensory tufts on segments 3, 8, 9, and 10. Palpal segments (Fig. 2, *b*) in proportion of 8:12:22:8:8, third segment moderately swollen with a small, shallow sensory pit.

Mesonotum rather narrow, color uniform dull brown, three very faintly indicated narrow, darker, longitudinal lines from level of humeral pits to scutellum, the latter concolorous with mesonotum. Postscutellum and pleura dark brown. Legs brown; femora with subapical, tibiae with sub-basal, narrow pale rings and mid and hind tibiae with apices broadly pale.

Wing (Fig. 2, *a*) with two complete anterior radial cells, both rather narrow; costa extending to 0.7 wing length; sparse macrotrichiae on distal third of wing. Wing markings practically the same as those of *uniradialis* n. sp., but only the tip of second anterior radial cell in a pale area; pale markings of wing predominant, but not to the degree found in *uniradialis*. Halteres pale.

Abdomen dark brown; spermathecae two, subequal, pyriform.

Male genitalia (Fig. 2, *c*, *d*). Ninth sternite short, with very shallow mesal excavation, the membrane bare; ninth tergite short and broad with very long, slender, apicolateral processes and a distinct mesal cleft at apex. Basistyles stout, ventral roots wedge shaped, the sharp points nearly meeting mesad, the dorsal roots shorter, curved and stout; dististyles slightly curved, gradually tapered to stout, blunt apices. Aedeagus stocky, with basal arms abruptly bent; distal portion stout, tapered to a bluntly rounded apex. Parameres (Fig. 2, *c*) with bases knobbed, stems very slender, abruptly curved just before basal fourth, the following portions slightly sinuate, abruptly bent at middle, the distal halves gradually tapered to slender, needlelike, simple points.

Holotype ♀, allotype, Mojinga Swamp, Fort Sherman, Canal Zone, October 24, 1951, F. S. Blanton (light trap) (type no. 61498, U.S.N.M.). Paratypes: 8 ♂♂, 42 ♀♀, same data except dates August 28 to November 28, 1951.

This species is superficially very similar to *uniradialis* n. sp., but is readily distinguished from it by the two completely formed radial cells, shorter costa, macrotrichiae at wing tips, and in the male, by the long apicolateral processes of the ninth tergite, slender, simple parameres, aedeagus with short basal arch and by the shape of the dorsal and ventral roots of the basistyles. *Culicoides pachymerus* Lutz, described from Amazonas, Brazil, appears to be closely related in the general wing pattern and in the shapes of the anterior radial cells, but the description is too scanty to make a close comparison. In *pachymerus*, however, the dark wing markings are more extensive and the fore and hind tibiae are said to be greatly swollen. We dedicate this species to Col. Francis B. Kintz, Surgeon of the U. S. Army Caribbean, whose cooperation made this study possible.

Culicoides carpenteri Wirth and Blanton, n. sp.
Fig. 3, *a–e*

♀. Length 1 mm, wing 1.0 mm by 0.45 mm.

Head brown, eyes narrowly separated, bare. Antennae with flagellar segments in proportion of 20:15:18:18:18:18:18:18:30:30:35:40:50, distal sensory tufts on segments 3, 11, 12, 13, 14. Palpal segments (Fig. 3, *c*) in proportion of 10:40:30:12:12, third segment scarcely swollen, with broad, shallow, sensory pit near apex.

Mesonotum (Fig. 3, *b*) elongate; color tawny yellowish brown, anterior portion except humeri darker brown and a fine median line and a sublateral pair of broader longitudinal bands of brown extending caudad to about middle of mesonotum. Scutellum dark in middle; postscutellum and pleura dark brown. Legs dark brown, femora with basal and subapical, tibiae with sub-basal and hind tibiae with apical, rather wide, pale bands.

Wing (Fig. 3, *a*) with anterior radial cells complete, narrow; costa to 0.6 of wing length; macrotrichia very sparse, appearing only on distal fourth of wing in cells R_5, M_1, and M_2. Wing predominantly pale, a very dark, blackish, stigmal spot over second anterior radial cell and distal third of first; diffuse dark patches on wing just proximad of broad pale area around crossvein r-m, over vein M_{3+4}, Cu_1 midway between base and fork, halfway across cell R_5 behind stigmal spot, across middle of distal half of cell R_5 and continued along vein M_1 to wing tip

forming an oval pale spot at apex of cell R_5 at wing margin; narrowly at medial fork and across basal half of mediocubital fork and subapically across cell M_1 and M_2, cutting off semicircular, apical spots in these cells at wing margin. Halteres pale.

Abdomen whitish on basal half above, light brown elsewhere; spermathecae two, slightly unequal, ovoid to slightly pyriform, the bases of the ducts sclerotized for a distance of a fourth of length of spermathecae.

Male genitalia (fig. 3, *d*, *e*). Ninth sternite short with shallow mesal excavation, the posterior membrane bare; ninth tergite tapered to a pair of broadly separated, triangular apicolateral processes. Basistyles with ventral roots large and boat-hook shaped, their apices nearly touching mesad, dorsal roots nearly as long, slender; dististyles slightly curved, slender, with slightly enlarged, pointed apices. Aedeagus with basal arch rounded, extending to two-thirds of total length, the very short distal portion broad with truncated apex. Parameres (Fig. 3, *d*) with knobbed bases, rather stout stems bent at about half their lengths, each with a distoventral pouch of same diameter as stem and about 1.5 times as long; apical portions about half the diameter of stems, tapered to pointed apices and each with a subapical fringe of about a dozen very fine hairs.

Holotype ♀, Madden Dam, Canal Zone, June 6, 1951, F. S. Blanton (light trap) (type no. 61500, U.S.N.M.). Allotype, Mojinga Swamp, Fort Sherman, C. Z., December 10, 1951. Paratypes: 16 ♀ ♀, same data as holotype; 24 ♀ ♀, same data as allotype, except dates August 15 to December 10, 1951; 1 ♀, Loma Boracha, C. Z., October 23, 1951; 2 ♀ ♀, Fort Sherman, C. Z., June 7, 1951; 1 ♀, Barro Colorado Island, January–March 1944, J. Zetek.

The Barro Colorado Island specimen was included by Barbosa as a paratype of *panamensis*, which however, is a much different species, with a light spot straddling vein M_2 of the wing. *C. carpenteri* might be confused with pale specimens of *galindoi* n. sp., but by microscopic examination of the female palpi and male genitalia the two species may readily be separated. We are pleased to have the opportunity to name this species in honor of Col. Stanley J. Carpenter, formerly entomologist for the U. S. Army Caribbean, whose interest in the Panama *Culicoides* problem gave great impetus to this project.

Culicoides galindoi Wirth and Blanton, n. sp.
Fig. 4, *a–f*

♀. Length 1.0 mm, wing 0.9 mm by 0.38 mm.

Head brown; eyes contiguous, bare. Antennae with flagellar segments in proportion of 20:15:15:15:15:15:15:25:25:30:30:40, distal sensory tufts on segments 3, 7, 8, 9, 10. Palpal segments (Fig. 4, *c*) in proportion of 10:20:20:8:10, third segment slightly swollen, with well developed subapical sensory pit.

Mesonotum (Fig. 4, *b*) rich brown, on anterior half with extensive pruinose yellowish brown markings; principally a large pair of submedian patches and two sublateral pairs of smaller spots; posterior half almost entirely pale; scutellum dark in middle. Postscutellum and pleura dark brown, almost black. Legs dark brown, fore and mid femora with subapical, and all tibiae with subbasal, narrow pale rings.

Wing (Fig. 4, *a*) nearly bare, sparse macrotrichia distad of level from end of costa to end of vein M_{3+4}; anterior radial cells short, complete, costa to 0.6 of wing length. Second anterior radial cell and distal half of first included in a very dark spot; a very light spot over r-m crossvein from anterior wing margin to level of anterior media; a double light spot in cell R_5 at end of costa, a very large rounded light spot at apex of cell R_5, broadly meeting wing margin and usually continued along it a little way toward wing tip; two long light spots in cell M_1, the second broadly meeting wing margin; base of cell M_2 with continuous light streak to transverse dark band at level of end of vein M_{3+4} and a broad apical light spot at wing margin; base of anal cell pale and a large double light spot at apex. Halteres pale.

Abdomen dull, brownish black; spermathecae two, subequal, pyriform (Fig. 4, *d*).

Male genitalia (Fig. 4, *e*, *f*). Ninth sternite very short, with shallow mesal excavation, the membrane spiculate; ninth tergite short and strongly tapered, with very short, triangular, apicolateral processes. Basistyles stout, dorsal roots slender, ventral roots longer and boat-hook shaped; their apices contiguous mesad; dististyles slender, with curved, pointed apices. Aedeagus with strong basal arch, the basal arms slender and curved, apex a short, rounded lobe. Parameres (Fig. 4, *e*) with crooked, knobbed bases, the stems slender and slightly sinuate, the apices abruptly recurved ventrad, each with three subapical lateral barbs.

Holotype ♀, allotype, Mojinga Swamp, Fort Sherman, Canal Zone, October 24, 1951; F. S. Blanton (light trap) (type no. 61501, U.S.N.M.). Paratypes: 26 ♂♂, 38 ♀♀, same data as types, except dates August 15 to October 24, 1951; 1 ♀, Cerro Campaña, Panama Prov., July 3, 1951; 1 ♀, Pacora, Panama Prov., June 4, 1951; 2 ♂♂, 1 ♀, Madden Dam, C. Z., September 21, 1951; 1 ♀, Arraijan, Panama Prov., August 8, 1951; 9 ♂♂, 13 ♀♀, Loma Boracha, C. Z., October 29, 1951.

Culicoides limai Barretto, from São Paulo, Brazil, is very similar but has a small ventral lobe on the male parameres, the basal arch of the aedeagus is narrower, the mesonotum has only a pair of small, anterior, sublateral pale patches; the scutellum is dark on the extreme ends as well as in the middle, and the tibiae have subapical pale bands on the fore and mid legs and at the bases and apices of the hind pair. From the original description, *wokei* Fox might be confused with *galindoi*, but Fox's species is larger, the mesonotum has a faintly mottled pattern of punctiform dots and the wing is nearly bare with the markings very faint and diffuse. This species is named in honor of Dr. Pedro Galindo, of the Gorgas Memorial Laboratory, one of the leaders of the Panamanian Republic in the work on Diptera of medical importance.

Culicoides vargasi Wirth and Blanton, n. sp.
Fig. 5, *a–e*

♀. Length 1.0 mm, wing 0.9 mm by 0.42 mm.

Head pruinose dark brown; eyes nearly contiguous, bare. Antennae with flagellar segments in proportion of 15:12:12:12:12:12:12:12:20: 22:25:28:36, distal sensory tufts on segments 3 and 7–10. Palpal segments (Fig. 5, *c*) in proportion of 8:12:25:9:11, third segment swollen with a broad, shallow, subapical, sensory pit.

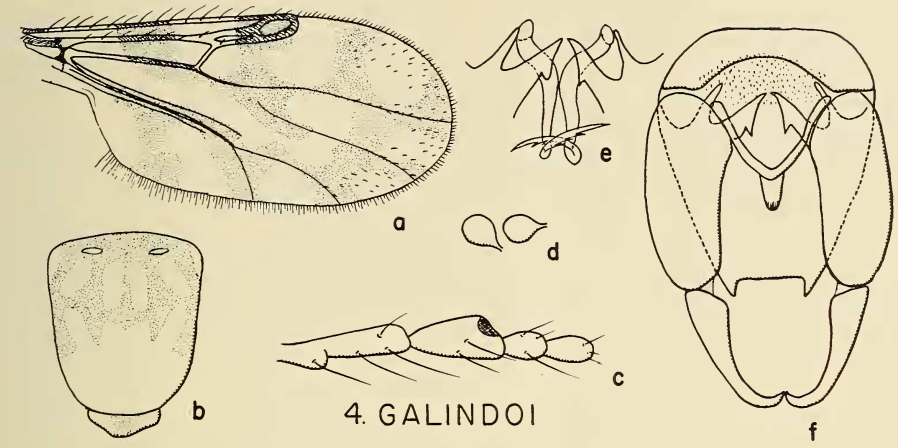
Mesonotum (Fig. 5, *b*) dark brown, with prominent pattern of large, pruinose gray patches, including a large, contiguous, quadrate pair in middle before suture, a pair of rounded spots over humeral pits, three pairs of rounded, lateral spots and quadrate prescutellar sensory areas margined with gray. Scutellum gray, brown in middle. Legs brown, femora with subapical and tibiae with subbasal pale bands, hind tibiae with apices broadly pale.

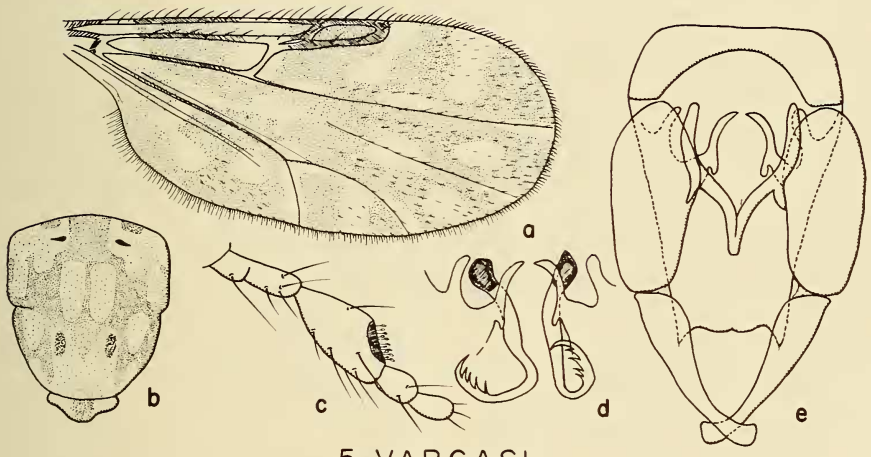
Wing (Fig. 5, *a*) with anterior radial cells normal, short; costa to 0.6 of wing length; macrotrichia very sparse and in rows over distal third of wing, a few in anal cell. Prominent yellow spots on anterior wing margin at wing base and over r-m crossvein, the latter spot extending to slightly behind anterior media, the area between these two spots and a stigmal spot over second anterior radial cell and distal half of first very dark. Cell R_5 with two hourglass-shaped, transverse light spots, the first just past end of costa, often divided into two separate, round spots, the second midway between this one and wing tip, both broadly meeting wing margin; cell R_5 also with two linear pale spots on anterior side of vein M_1, the first one short, midway between pale spot over r-m crossvein and one at end of costa, the second extending between posterior ends of the two anterior pale spots in cell R_5. Apices of veins M_1 and M_2 pale margined; a prominent light spot straddling middle of vein M_2; small, rounded, submarginal light spots in cells M_1 and M_2; cell M_2 also with a large light spot behind medial fork and a small light spot just in front of mediocubital fork; veins M_{3+4} and Cu_1 entirely pale margined, the latter broadly so, the former broadly connected to a large light spot in cell M_4 which broadly meets wing margin midway of cell, anal cell with basal pale spot connected to pale areas at base of cell M_2 and with a single, round light spot just behind mediocubital fork. Halteres pale.

Abdomen dark brown; spermathecae two, subequal, pyriform.

Male genitalia (Fig. 5, *d*, *e*). Ninth sternite with broad, deep, mesal excavation, the posterior membrane bare; ninth tergite long and tapered, the apicolateral processes short and triangular. Basistyles with ventral roots long, curved and slender, with small caudal hook; dorsal roots almost as long; dististyles slender and slightly curved. Aedeagus with basal arms broadly separate to two-thirds of total length, the fork angular, a pair of short, bladelike processes on caudal side of shoulders of basal arms; distal portion slender, with rounded apex with faint serrations. Parameres (Fig. 5, *d*) with large basal knobs, stems slender and nearly straight, abruptly recurved at distal three-fifths with apices narrowed and each bearing a fringe of 4–5 sharp spines and a strong, bent, distal spine.

Holotype ♀, allotype, Las Tablas, Los Santos Prov., Panama, June 14, 1951, F. S. Blanton (light trap) (type no. 61502, U.S.N.M.). Paratypes: 9 ♂♂, 10 ♀♀, same data as type; 12 ♂♂, 59 ♀♀, Mojinga Swamp, Fort Sherman, C. Z., August 28, 1951 to January 1952; 1 ♂, Río Hato, Cocle Prov., September 24, 1951.





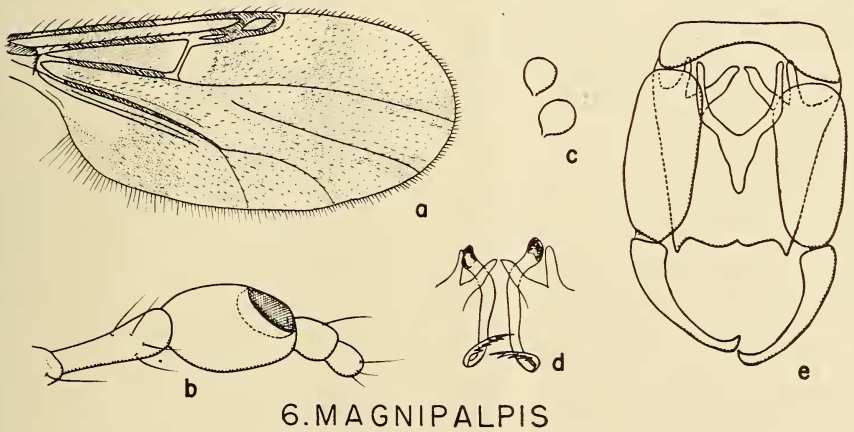


Fig. 4.—*Culicoides galindoi: a*, Female wing; *b*, mesonotal pattern; *c*, female palpus; *d*, female spermathecae; *e*, male parameres; *f*, male genitalia. Fig. 5.—*Culicoides vargasi: a*, Female wing; *b*, mesonotal pattern; *c*, female palpus; *d*, male parameres; *e*, male genitalia. Fig. 6.—*Culicoides magnipalpis: a*, Female wing; *b*, female palpus; *c*, female spermathecae; *d*, male parameres; *e*, male genitalia.

Other material examined: Venezuela, 3 ♂♂, 11 ♀♀, Ocumare del Tuy, May 28, 1951, I. Ortiz.

This species is the Neotropical counterpart of *baueri* Hoffman, which it very closely resembles. In *baueri*, described from Maryland, there is only one pale line bordering the anterior side of vein M_1, this located directly behind the light spot at the end of the costa; the hind femora lack the subapical pale rings and the hind tibiae lack the apical pale bands; the pit on the third palpal segment is small and deep and the spermathecae are subspherical. There are, however, no important differences in the male genitalia. We dedicate this species to Dr. Luis Vargas, of the Instituto de Salubridad y Enfermedades Tropicales, México, D. F., México, a very enthusiastic and esteemed worker on Neotropical *Culicoides*.

Culicoides magnipalpis Wirth and Blanton, n. sp.
Fig. 6, *a–e*

♀. Length 1.1 mm, wing 1.0 mm by 0.48 mm.

Head dark brown; eyes bare. Antennae with flagellar segments in proportion of 20:15:18:20:20:20:20:20:25:25:25:30:40, distal sensory tufts on segments 3 and 11–15. Palpal segments (Fig. 6, *b*) in proportion of 10:20:30:8:7, third segment remarkably bulbously swollen with broad, deep, sensory pit on distal half.

Mesonotum tawny yellowish brown, a faint, contiguous pair of lighter yellowish, oval, submedian spots on disc; humeral corners with a small pair of whitish spots; area between these and sensory pits blackish; scutellum tawny, slightly darker in middle. Postscutellum and pleura blackish, the latter pale on upper half. Legs dark brown, femora with subapical and tibiae with subbasal, narrow pale rings, distal tarsal segments pale.

Wing (Fig. 6, *a*) with anterior radial cells complete: costa to 0.6 of wing length: macrotrichia long and numerous, extending to base of wing except in basal cell. Anterior margin of wing with yellowish spots at wing base, over r-m crossvein (extending only to anterior media), a large rounded spot at end of second anterior radial cell extending two-thirds way to vein M_1 and a large pale oval spot nearly filling distal half of cell R_5 past level of end of costa. Cell M_1 with two light spots, the distal one broadly attaining wing margin: cell M_2 with a long pale spot just ahead of mediocubital fork, and a second rounded spot broadly attaining wing margin. Cell M_4 with a large rounded spot in distal half: anal cell with one large pale spot in distal portion. Halteres pale.

Abdomen dark brown: spermathecae (Fig. 6, *c*) two, subequal, subspherical.

Male genitalia (Fig. 6, *d*, *e*). Ninth sternite with broad, deep mesal excavation, the posterior membrane bare: ninth tergite slightly longer than basal breadth, apicolateral processes short and widely separated, a slight median cleft. Basistyles with ventral roots slightly foot-shaped, their pointed apices nearly meeting mesad; dorsal roots slightly shorter, slender and simple; dististyles slender, slightly curved, their apices bent and pointed. Aedeagus with basal arch to slightly over half of total length, the basal arms stout and bent midway forming a rooflike arch; distal portion stout at base, apex narrower and rounded. Parameres (Fig. 7, *d*) with bases knobbed, stems slender, bent near bases, middle portions straight, then bent outward and then ventromesad with tips slender and needlelike and each bearing four lateral barbs.

Holotype ♀, allotype, Cerro Campaña, Panama, July 3, 1951, F. S. Blanton (light trap) (type no. 61503, U.S.N.M.). Paratypes: 4 ♀♀, same data as type.

This species takes its place near the *debilipalpis* group of species on the basis of its wing markings, but differs from them in having the distal light spots attaining the wing margin in cells R_5, M_2, and M_4, and the third palpal segment is very distinctively swollen.

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ENTOMOLOGY.—Wenzella obscura, *a new genus and new species of flea from Guatemala (Siphonaptera)*.[1] Robert Traub, Lt. Col., MSC.[2]

The siphonapteran fauna of Guatemalan rodents, although of potential medical significance, is relatively little known. Among the excellent ectoparasites collected by a Chicago Natural History Museum expedition to Guatemala in 1948, is the remarkable flea here described as a new genus of the family Hystrichopsyllidae, subfamily Rhadinopsyllinae.

Wenzella, n. gen.

Diagnosis.—Differs from all known rhadinopsylline genera in *each* of the following characteristics: Pronotal comb lacking; antenna with a conspicuous flange (Fig. 1, *A.F.*) extending from base to near apex of club, ensheathing much of first two segments; lacking even vestiges of abdominal comb of spinelets on terga two through six; prosternosome without a sinus to receive the small first vinculum (*VC.1*); fourth vinculum distinct (Fig. 10, *VC.4*); male with three antesensiliary bristles; male eighth tergum (Fig. 7, *8T.*) very large, inclosing much of genitalia; maxillary palpi (Fig. 1, *M.P.*) very long, extending to apex of foretrochanters, suggesting *Megarthroglossus* of Anomiopsyllinae.

Agrees with *Stenischia* Jordan, 1932, in that the lateral metanotal area is not set off as a distinct sclerite, and instead the metanotum extends as a downward-directed long vertical triangle between metepisternum and metepimere.[3] Differs from other members of the subfamily (except *Trichopsylloides* Ewing, 1938) in lacking a genal ctenidium.

Description.—Caput integrecipitate, with internal but distinct tubercle (Fig. 1, *TB.*). Anterior and dorsal margins of head evenly and very broadly convex, not rounded; in female, those margins straighter. Genal region (*GN.*) extending downward beyond mid-point of maxillary lobe. Head chaetotaxy reduced in number and size of bristles, which are not set in distinct rows; postantennal region with but one row of bristles, that marginal. Eye greatly reduced. Palpi (*L.P.*) 5-segmented, not extending beyond apex of forecoxae, much shorter than elongate maxillary palpi. Antenna peculiar in position and shape; although genus is integrecipitate in both sexes, in each sex the base of antenna is removed from crown of head (in other integrecipitate fleas, that of male is usually near top of head); antennal groove not definitely extending onto propleuron; first antennal segment directed anteriorly, almost horizontal, not pointing ventrad as is typical in other fleas; club almost rhomboidal, scarcely narrowed apically, its segments often partially fused, some reduced in size; club apparently consisting of seven or eight segments (actually nine present); with a conspicuous triangular flange. First vinculum (*VC.1*) relatively broad. Margin of prosternosome straight, unmodified at level of insertion of this vinculum. Tentorial bridge (*T.BR.*) unusual in being displaced caudad, near vinculum (overlapping in specimen drawn); vermiform. Pronotum with but one complete row of bristles, those short; comb completely absent. Mesonotum (Fig. 10, *MSN.*) with two rows of bristles, the first somewhat irregular; with a relatively long, well-developed phragma (*PH.2*); with two or three pseudosetae (*PS.S.*). Mesepisternum (*MPS.*) with anterior margin fairly straight. An internal furca (*I.F.2*) conspicuous, extending dorsad more than half height of mesepimere (*MPM.*). Mesepimere longer than broad (high), much longer than *MPS.* Mesosternosome (*MPS.* and *MPM.*) with chaetotaxy reduced to about four bristles. Metanotum (*MTN.*) with a distinctive beak-shaped conspicuous phragma (*PH.3*) (not as broad as that of mesonotum); with two rows of bristles; about

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[3] In *Trichopsylloides* Ewing the metanotum is similarly downward-directed, but the lateral metanotal area is fairly well defined.